[1]2016-01-25

Project Plan for the CEN Workshop Agreement

Delivered by the CEN Workshop on
Virus sensor system for monitoring rotavirus, norovirus and hepatitis A virus in various types of water intended for human use

(approved at the Kick-off meeting on 2016-01-25)

[1] *Here the date of updating should go, updated by the last editor*

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1. Status of the Project Plan

- Initial draft Project Plan, to be further developed, prior to submission for approval
- Draft Project Plan to be approved at the Kick-off meeting of the Workshop
- Approved Project Plan

2. Background to the Workshop

2.1 General

Water-borne viral diseases pose high risks for public health worldwide. Human enteric viruses are frequently identified in various types of environmental water samples, and as few as 10-100 virus particles can cause serious illness in humans. The health significance of these agents ranges from poliomyelitis (polio), hepatitis and gastroenteritis to innocuous infections. The urban wastewater contains a large number of pathogen viruses, and even the most advanced wastewater treatment is not safe for full removal of virus particles. It is an urgent task to develop a novel, cost effective, portable, on-site detection system, which is capable for monitoring human enteric viruses in different water bodies to prevent the spread of virus diseases.

2.2 The AquaVir project

AquaVir, an EU-FP7 funded project, is developing a virus sensor system for monitoring rotavirus, norovirus and hepatitis A virus in various types of water sources as a means of ensuring the safety of water supplies meant for human use and consumption. The aim of the AquaVir project is to develop working prototype systems based on end-user input that can be evaluated and matured for production and delivery to relevant end-users throughout the EU.

The broad nature and the diversity of virus detection and monitoring in water supplies present an impressive analytical challenge that has been difficult to solve using single analytical methods, protocols and analytical systems. It is thus the main objective of the AquaVir project to provide a flexible platform that can be assembled for specific virus monitoring tasks by employing modular subsystems tailored to the specific virus application.

2.3 Motivation for the CEN Workshop

Contribution to standardization activities has been specified as one of the means for dissemination of the AquaVir project results.
The organizational structure of the project reflects this and includes a "Standardization" task where all activities related to standardization work are bundled. Results from different tasks of the project seem to be auspicious.

The urban wastewater contains large number of pathogen viruses, and even the most advanced wastewater treatment is not safe for full removal of virus particles.

The conventional biological water quality indicators do not provide adequate information about the presence of pathogenic viruses. The currently available reliable virus test - based on molecular biology - is expensive, time consuming and labor intensive, thus limited to few laboratories with sophisticated facilities and well-trained personnel, even though the protection of water networks against pathogenic viruses is crucial.

In this framework a novel, cost effective, on-site detection system, which is capable for monitoring human enteric viruses in different types of water would be of great importance. Therefore, a standard process which describes a detection system characterized by the before-mentioned attributes is missing.

For this reason the following topic has been identified as exploitable knowledge for standardization:

Virus sensor system for monitoring rotavirus, norovirus and hepatitis A virus in various types of water intended for human use

2.4 Market environment

The following stakeholders are considered as target groups for the use and application of a virus sensor system for monitoring viruses in water:

- Developers / operators / producers of sensor chips
- Water supply companies
- Environmental authorities
- Health care companies and the public health sector
- Authorities and companies from the disaster management and civil protection
- Companies from the food industry
- R&D community
- Peace keeping military force

2.5 Existing standards and standard related activities and documents

A screening of existing standards and standardization activities has been reported within the project.

An overview of the identified documents can be found in Annex C.

Most of the identified standards in Annex C are related to other tasks of the AquaVir project or are just rudimentary linked to the project. However, those documents that concur substantively with the topic of monitoring rotaviruses noroviruses and hepatitis A viruses do not focus on a standard sensor system or the detection in water.

The most important standards for the Project Plan are listed in the following Table 1:

Table 1 Existing standards related to proposed topic

DIN EN ISO 15839	Water quality - On-line sensors/analysing equipment for water - Specifications and performance
DIN 38402-60	German standard methods for the examination of water, waste water and sludge - General information (group A) - Part 60: Analytical quality assurance for chemical and physicochemical water analysis

ISO 5667-11	Water quality - Sampling - Part 11: Guidance on sampling of groundwaters
DS/ISO 17381	Water quality - Selection and application of ready-to-use test kit methods in water analysis
DIN EN 16479	Water quality - Performance requirements and conformity test procedures for water monitoring equipment - Automated sampling devices (samplers) for water and waste water
ISO 10705-1	Water quality - Detection and enumeration of bacteriophages - Part 1: Enumeration of F-specific RNA bacteriophages
ISO 10705-2	Water quality - Detection and enumeration of bacteriophages - Part 2: Enumeration of somatic coliphages
DIN EN ISO 5667-16	Water quality - Sampling - Part 16: Guidance on biotesting of samples
ASTM D 5851	Standard Guide for Planning and Implementing a Water Monitoring Program
ASTM D 5997	Standard Test Method for On-Line Monitoring of Total Carbon, Inorganic Carbon in Water by Ultraviolet, Persulfate Oxidation, and Membrane Conductivity Detection
ASTM D 5392	Standard Test Method for Isolation and Enumeration of Escherichia Coli in Water by the Two-Step Membrane Filter Procedure
ASTM D 3864	Standard Guide for On-Line Monitoring Systems for Water Analysis
ASTM E 1052	Standard Test Method to Assess the Activity of Microbicides against Viruses in Suspension

This topic is not concerned by any directive or national legislation.

3. Workshop proposers and Workshop participants

Contact Point: FP 7 AquaVir (R&D project)
Coordinator contact: Noemi Rozlosnik
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Technical University of Denmark
Produktionstorvet
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The participants of the kick-off meeting will be listed in Annex A. The list of registered participants having approved the current Project Plan will be in Annex B.

4. Workshop scope and objectives

This CEN Workshop is proposed based on the scope, objectives and the outcomes of the AquaVir project, which is funded by the European Commission.

The overall goal of the envisaged CEN Workshop Agreement “Virus sensor system for monitoring rotavirus, norovirus and hepatitis A virus in various types of water intended for human use” is to define a sensor system which is intended to provide a rapid, simple and economic method for monitoring dangerous levels of hepatitis A virus, norovirus and rotavirus in various types of water intended for human use via consumption, recreation or foodstuff production.

The sensor system proposed in the project is suitable to be adopted as standard for a monitoring to detect viruses in water. The system can be divided mainly in four fields:

- Risk assessment and management
- A Virus sampling and filtering unit (VSFU)
- A virus sensor unit (VSU)
- Online-monitoring

5. Workshop programme

The deliverable of this Workshop consists of one CEN Workshop Agreement; it shall be drafted and published in English.

Work plan

Anyone can comment on this Project Plan of the envisaged CWA. All comments received will be considered by the chairperson preliminary to the kick-off meeting of participants of the Workshop where each comment received shall be presented, discussed and resolved.

Any meeting except for the kick-off and the final meeting can be organized as virtual meetings. The time schedule for the Workshop is being influenced by the runtime of the AquaVir project. Table 2 gives an overview of the planned work schedule.

Table 2 Work plan

time / activity	2015		2016							
	11	12	1	2	3	4	5	6	7	8
Public availability of project plan										
Kick-Off Meeting										
Elaboration of Draft CWA										
Endorsement of final version of CWA										

6. Workshop structure

This Workshop shall be led by a chairperson and in case of absence or unavailability, by a vice-chair. The Workshop secretariat shall be responsible for the management of the Workshop.

6.1 CEN Workshop Chairperson

A proposal for the chairperson will be made by the Workshop proposers; he/she or any other candidate nominated during the period of publication of this Project Plan or at the Kick-Off will be approved at the Kick-off meeting by the parties present. His / her responsibilities include:

- Chairing the CEN Workshop meetings,
- Representing the CEN Workshop in outside meetings in cooperation with CCMC and with the Workshop secretariat,
- Monitoring the progress of the CWA,
- Interface with CCMC regarding strategic directions, problems arising, external relationships, etc.

6.2 CEN Workshop Vice-Chair

The Workshop vice-chair shall be appointed in the Kick-off meeting. The vice-chair shall support and assist in all responsibilities outlined for the chairperson. In the absence of the chairperson, the vice-chair will represent the CEN Workshop at outside meetings in cooperation with CCMC and will interface with CCMC regarding strategic directions, problems arising, external relationships etc.

6.3 CEN Workshop Secretariat

The CEN Workshop Secretariat is providing the formal link to the CEN system. The following main activities will be carried out by the Workshop Secretariat:

- Organizing CEN Workshop plenary meetings,
- Producing CEN Workshop minutes and action lists,
- Forming the administrative contact point for CWA project,
- Managing CEN Workshop attendance lists,
- Managing CEN Workshop document registers,
- Following-up action lists,
- Assisting Chairperson in monitoring and following-up of electronic discussions – in case the CEN Workshop is mainly working by electronic means,
- Administrating the liaison with relevant CEN/TCs, if applicable.

7. Resource requirements

7.1 Costs of the CEN Workshop Secretariat

The administrative costs of CEN Workshop Secretariat will be covered by resources from the FP7 project AquaVir.
The copyright of the CWA shall be with CEN.

7.2 Participation and Registration Fee

The registration and participation at this CEN Workshop is free of charge; each participant shall bear his/her own cost for travel and subsistence.

8. Related activities, liaisons, etc.

While preparing this Project Plan no requirements for liaison or other related activities have been occurred.

CEN/TC 230 Water analysis agreed with the initiation of the CWA.

The Workshop shall report to *CEN/TC 230* in accordance with the needs, either in person or by correspondence, highlighting the most important issues and any possible conflicts that arise. If *CEN/TC 230* is interested, a presentation of the AquaVir project to the Technical Committee can be organized.

CEN/TC 230 may also request the Workshop Secretariat to provide any specific information it might require and has the right to send one representative to Workshop meetings as an observer, free of charge.
On publication, the CWA shall be submitted to CEN/TC 230 for consideration and with a view to its possible transformation into a European Standard or other CEN/CENELEC deliverable.

9. Contact points

Such as Workshop Chairperson, Workshop Secretariat, Editors, CCMC contact, etc.

Chairperson:
Ms Noemi Rozlosnik
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Annexes

Annex A: List of Workshop proposers and participants

This Workshop has been proposed by a number of the AquaVir partners and will result in a CEN Workshop Agreement (CWA).

Other interested stakeholders are welcomed to register for membership in accordance with the CEN Rules for CEN Workshops. New participants could join the WS in accordance with point 4.3.2 of CEN/CLC Guide 29 on CEN/CLC Workshop agreements expressing their interest by writing at philipp.albrecht@din.de.

Table 3 List of Workshop proposers

	Company	**Name**
1	DTU Nanotech	Noemi Rozlosnik Mark Holm Olsen Julie Kirkegaard Maria Dimaki
2	DELTA	Julia Skov
3	Philips BioCell (before: Unisensor A/S)	Tom Olesen
4	TorVergata University	Maurizio Divizia
5	BME – Budapest University of Technology and Economics	Ferenc Szilágyi Mária Haszpráné-Takács Péter Burdai
6	CORIS Bio Concept	Pascal Mertens
7	Sanner	Dominik Braun Stefanie Laqua

8	DHI	Claus Jorgensen Gerald Heinicke
9	Göteborgs Stad	Lena Blom Anette Hansen
10	Acea LaboratoRI SpA	Laura Diaco
11	SIMTEJO, Portugal	Vanda Barroso
12	Empresa Portuguesa das Águas Livres (EPAL), Portugal	Rui Neves Carneiro
13	Cantacuzino National Institute for R&D (CNRI), Romania	Anda Baicus

Table 4 List of Workshop participants

	Company	**Name**
1	DIN (Secretary)	Philipp Albrecht
2	DTU Nanotech	Anders Bjerrum
3	CNR ISMN, E.C.	Marcello Cacace
4	Veolia Water France	Karine Delabre
5	Tor Vergata University	Maurizio Divizia

6	DHI	Gerald Heinicke
7	CEN	Andrea Nam
8	DTU Nanotech	Mark Olsen
9	DTU Nanotech	Noemi Rozlosnik
10	Budapest University of Technology and Economics	Ferenc Szilagyi

Annex B: participants that approved Project Plan during Kick-off meeting

	Company	**Name**
1	DTU Nanotech	Anders Bjerrum
2	CNR ISMN, E.C.	Marcello Cacace
2	Tor Vergata University	Maurizio Divizia
3	DHI	Gerald Heinicke
4	DTU Nanotech	Mark Olsen
5	DTU Nanotech	Noemi Rozlosnik
6	Budapest University of Technology and Economics	Ferenc Szilagyi

Annex C: relevant standards and Standards Committees

Standards Committee	Title
CEN/TC 230	Water analysis

Number of document	Title of document
DIN EN ISO 15839	Water quality - On-line sensors/analysing equipment for water - Specifications and performance tests (ISO 15839:2003);
DS/ISO 17381	Water quality - Selection and application of ready-to-use test kit methods in water analysis
CAN/CSA-B483.1-07 (R2012)	Drinking Water Treatment Systems
ASTM D 596	Standard Guide for Reporting Results of Analysis of Water
ISO/TS 13530	Water quality - Guidance on analytical quality control for chemical and physicochemical water analysis
DIN 32645	Chemical analysis - Decision limit, detection limit and determination limit under repeatability conditions - Terms, methods, evaluation
DIN EN ISO 17994	Water quality - Requirements for the comparison of the relative recovery of microorganisms by two quantitative methods
ASTM D 5738	Standard Guide for Displaying the Results of Chemical Analyses of Groundwater for Major Ions and Trace Elements-Diagrams for Single Analyses
ANSI/NSF 55 (i24)	Ultraviolet microbiological water treatment systems
ASTM D 5754	Standard Guide for Displaying the Results of Chemical Analyses of Groundwater for Major Ions and Trace Elements-Trilinear Diagrams for Two or More Analyses
ASTM D 6564	Standard Guide for Field Filtration of Groundwater Samples
ANSI/NSF 42 (i59)	Drinking water treatment Units - Aesthetic effects
ANSI/NSF 58 (i51)	Reverse osmosis drinking water treatment systems
ANSI/NSF 53 (i67)	Drinking water treatment units - Health effects
ASTM D 5905	Standard Practice for the Preparation of Substitute Wastewater
API PUBL 4751	Evaluation of Water Quality Translators for Mercury
DIN 38402-60	German standard methods for the examination of water, waste water and sludge - General information (group A) - Part 60: Analytical quality assurance for chemical and physicochemical water analysis (A 60)
DIN 38406-17	German standard methods for the examination of water, waste water and sludge - Cations (group E) - Part 17: Determination of uranium - Method using adsorptive stripping voltammetry in surface water, raw water and drinking water (E 17)
DIN 38407-43	German standard methods for the examination of water, waste water and sludge - Jointly determinable substances (group F) - Part 43: Determination of selected easily volatile organic compounds in water - Method using gas chromatography and mass spectrometry by static headspace technique (HS-GC-MS) (F 43)
ASTM D 7729	Standard Practice for Determining and Expressing Precision of Measurement Results, in the Analysis of Water, as Relative Standard Deviation, Utilizing DQCALC Software
ASTM D 7782	Standard Practice for Determination of the 99 %/95 % Critical Level (WCL) and a Reliable Detection Estimate (WDE) Based on Within-laboratory Data
ASTM D 6956	Standard Guide for Demonstrating and Assessing Whether a Chemical Analytical Measurement System Provides Analytical Results Consistent with Their Intended Use

ASTM E 2091	Standard Guide for Use of Activity and Use Limitations, Including Institutional and Engineering Controls
ASTM E 2365	Standard Guide for Environmental Compliance Performance Assessment
Z762-95 (R2011)	Design for the Environment (DFE)
Z763-96 (R2007)	Introduction to Environmental Risk Assessment Studies
ASTM E 2020a	Standard Guide for Data and Information Options for Conducting an Ecological Risk Assessment at Contaminated Sites
CWA 15884	Environmental technology verification - Soil and groundwater site characterization, monitoring and remediation technologies
ANSI/AWWA J 100	Risk and Resilience Management of Water and Wastewater Systems
ASTM D 3856	Standard Guide for Management Systems in Laboratories Engaged in Analysis of Water
ASTM E 2081	Standard Guide for Risk-Based Corrective Action
ISO 24510	Activities relating to drinking water and wastewater services - Guidelines for the assessment and for the improvement of the service to users
ISO 24512	Activities relating to drinking water and wastewater services - Guidelines for the management of drinking water utilities and for the assessment of drinking water services
ISO 5667-11	Water quality - Sampling - Part 11: Guidance on sampling of groundwaters
DIN 86292	Methods of sampling from waste water treatment plants on vessels and offshore structures
DIN ISO 5667-5	Water quality - Sampling - Part 5: Guidance on sampling of drinking water from treatment works and piped distribution systems (ISO 5667-5:2006)
DIN ISO 5667-14	Water quality - Sampling - Part 14: Guidance on quality assurance of environmental water sampling and handling (ISO 5667-14:1998)
DIN EN ISO 5667-16	Water quality - Sampling - Part 16: Guidance on biotesting of samples (ISO 5667-16:1998)
ASTM D 5851	Standard Guide for Planning and Implementing a Water Monitoring Program
DS/ISO 5667-21	Water quality - Sampling - Part 21: Guidance on sampling of drinking water distributed by tankers or means other than distribution pipes
DIN EN 16479	Water quality - Performance requirements and conformity test procedures for water monitoring equipment - Automated sampling devices (samplers) for water and waste water
DIN 38402-15	German standard methods for the examination of water, waste water and sludge - General information (group A) - Part 15: Sampling from running waters (A 15)
DIN 38402-24	German standard methods for the examination of water, waste water and sludge - General informations (group A) - Part 24: Guidance on sampling of suspended sediments (A 24)
ASTM D 3864	Standard Guide for On-Line Monitoring Systems for Water Analysis
ASTM D 5997	Standard Test Method for On-Line Monitoring of Total Carbon, Inorganic Carbon in Water by Ultraviolet, Persulfate Oxidation, and Membrane Conductivity Detection
ASTM D 6502	Standard Test Method for Measurement of On-line Integrated Samples of Low Level Suspended Solids and Ionic Solids in Process Water by X-Ray Fluorescence (XRF)
DIN CEN/TS 16800*DIN SPEC 38402-61	Guideline for the validation of analytical methods
DIN 38410-1	German standard methods for the examination of water, waste water and sludge - Biological-ecological analysis of water (group M) - Part 1: Determination of the saprobic index in running waters (M 1)
DIN EN 60861*VDE 0493-4-2	Equipment for monitoring of radionuclides in liquid effluents and surface waters (IEC 60861:2006, modified)
DS/ISO/IEC 13842	Information technology - 130 mm optical disk cartridges for information interchange - Capacity: 2 Gbytes per cartridge
ASTM D 5611	Standard Guide for Conducting a Sensitivity Analysis for a Groundwater Flow Model Application
ASTM D 6033	Standard Guide for Describing the Functionality of a Groundwater Modeling

	Code
ASTM D 6170	Standard Guide for Selecting a Groundwater Modeling Code
ASTM C 1745/C 1745M	Standard Test Method for Measurement of Hydraulic Characteristics of Hydrodynamic Stormwater Separators and Underground Settling Devices
ASTM C 1746/C 1746M	Standard Test Method for Measurement of Suspended Sediment Removal Efficiency of Hydrodynamic Stormwater Separators and Underground Settling Devices
ANSI/NSF 350-1	Onsite residential and commercial graywater treatment systems for subsurface discharge
ANSI/NSF 350-1 (i5)	Onsite residential and commercial graywater treatment systems for subsurface discharge
ASTM E 1052	Standard Test Method to Assess the Activity of Microbicides against Viruses in Suspension
ASTM E 1053	Standard Test Method to Assess Virucidal Activity of Chemicals Intended for Disinfection of Inanimate, Nonporous Environmental Surfaces
ASTM E 1950	Standard Practice for Reporting Results from Methods of Chemical Analysis
ASTM D 5952	Standard Guide for the Inspection of Water Systems for Legionella and the Investigation of Possible Outbreaks of Legionellosis (Legionnaires' Disease or Pontiac Fever)
ASTM D 5392	Standard Test Method for Isolation and Enumeration ofEscherichia Coli in Water by the Two-Step Membrane Filter Procedure
DIN EN ISO 6222	Water quality - Enumeration of culturable micro-organisms - Colony count by inoculation in a nutrient agar culture medium (ISO 6222:1999)
SFS-EN ISO 9308-3:en	Water quality. Detection and enumeration of Escherichia coli and coliform bacteria in surface and wastewater. Part 3: Miniaturized method (Most Probable Number) by inoculation in liquid medium (ISO 9308-3:1998)
DIN EN ISO 9308-1	Water quality - Enumeration of Escherichia coli and coliform bacteria - Part 1: Membrane filtration method for waters with low bacterial background flora (ISO 9308-1:2014)
DIN EN ISO 9308-2	Water quality - Enumeration of Escherichia coli and coliform bacteria - Part 2: Most probable number method (ISO 9308-2:2012)
DIN EN ISO 9308-3	Water quality - Detection and enumeration of Escherichia coli and coliform bacteria in surface and waste water - Part 3: Miniaturized method (most probable number) by inoculation in liquid medium (ISO 9308-3:1998)
DIN EN ISO 10705-1	Water quality - Detection and enumeration of bacteriophages - Part 1: Enumeration of F-specific RNA bacteriophages (ISO 10705-1:1995)
DIN EN ISO 10705-2	Water quality - Detection and enumeration of bacteriophages - Part 2: Enumeration of somatic coliphages (ISO 10705-2:2000)
DIN EN ISO 11731-2	Water quality - Detection and enumeration of Legionella - Part 2: Direct membrane filtration method for waters with low bacterial counts (ISO 11731-2:2004)
DIN EN 14486	Water quality - Detection of human enteroviruses by monolayer plaque assay
DIN EN ISO 16266	Water quality - Detection and enumeration of Pseudomonas aeruginosa - Method by membrane filtration (ISO 16266:2006)
DIN EN ISO 19250	Water quality - Detection of Salmonella spp. (ISO 19250:2010)
ISO 16240	Water quality - Determination of the genotoxicity of water and waste water - Salmonella/microsome test (Ames test)
DIN CEN ISO/TS 15216-1*DIN SPEC 10051-1	Microbiology of food and animal feed - Horizontal method for determination of hepatitis A virus and norovirus in food using real-time RT-PCR - Part 1: Method for quantification (ISO/TS 15216-1:2013)
DIN CEN ISO/TS 15216-2*DIN SPEC 10051-2	Microbiology of food and animal feed - Horizontal method for determination of hepatitis A virus and norovirus in food using real-time RT-PCR - Part 2: Method for qualitative detection (ISO/TS 15216-2:2013)
ASTM D 5259	Standard Test Method for Isolation and Enumeration of Enterococci from Water by the Membrane Filter Procedure
ISO 7875-1	Water quality - Determination of surfactants - Part 1: Determination of anionic surfactants by measurement of the methylene blue index (MBAS)
ISO 8245	Water quality - Guidelines for the determination of total organic carbon (TOC)

	and dissolved organic carbon (DOC)
DIN 38404-15	German standard methods for the examination of water, waste water and sludge; physical and physico-chemical parameters (group C); determination of beta activity per unit volume in drinking water, ground water, surface water and waste water (C 15)
ISO 6058	Water quality; Determination of calcium content; EDTA titrimetric method
ISO 6059	Water quality; Determination of the sum of calcium and magnesium; EDTA titrimetric method
ISO 6333	Water quality; Determination of manganese; Formaldoxime spectrometric method
ISO 6439	Water quality; determination of phenol index; 4-aminoantipyrine spectrometric methods after distillation
ISO 9963-2	Water quality - Determination of alkalinity - Part 2: Determination of carbonate alkalinity
ISO 10359-2	Water quality - Determination of fluoride - Part 2: Determination of inorganically bound total fluoride after digestion and distillation
ASTM D 511	Standard Test Methods for Calcium and Magnesium In Water
ASTM D 513	Standard Test Methods for Total and Dissolved Carbon Dioxide in Water
ASTM D 516	Standard Test Method for Sulfate Ion in Water
ASTM D 857	Standard Test Method for Aluminum in Water
ASTM D 858	Standard Test Methods for Manganese in Water
ASTM D 859	Standard Test Method for Silica in Water
ASTM D 1246	Standard Test Method for Bromide Ion in Water
ASTM D 1687	Standard Test Methods for Chromium in Water
ASTM D 1886	Standard Test Methods for Nickel in Water
ASTM D 2580	Standard Test Method for Phenols in Water by Gas-Liquid Chromatography
ASTM D 2972	Standard Test Methods for Arsenic in Water
ASTM D 3082	Standard Test Method for Boron in Water
ASTM D 3223	Standard Test Method for Total Mercury in Water
ASTM D 3372	Standard Test Method for Molybdenum in Water
ASTM D 3373	Standard Test Method for Vanadium in Water
ASTM D 3558	Standard Test Methods for Cobalt in Water
ASTM D 3559	Standard Test Methods for Lead in Water
ASTM D 3561	Standard Test Method for Lithium, Potassium, and Sodium Ions in Brackish Water, Seawater, and Brines by Atomic Absorption Spectrophotometry
ASTM D 3645	Standard Test Methods for Beryllium in Water
ASTM D 3651	Standard Test Method for Barium in Brackish Water, Seawater, and Brines
ASTM D 3695	Standard Test Method for Volatile Alcohols in Water by Direct Aqueous-Injection Gas Chromatography
ASTM D 3859	Standard Test Methods for Selenium in Water
ASTM D 3867	Standard Test Methods for Nitrite-Nitrate in Water
ASTM D 3920	Standard Test Method for Strontium in Water
ASTM D 4107	Standard Test Method for Tritium in Drinking Water
ASTM D 4130	Standard Test Method for Sulfate Ion in Brackish Water, Seawater, and Brines
ASTM D 4190	Standard Test Method for Elements in Water by Direct-Current Argon Plasma Atomic Emission Spectroscopy
ASTM D 4191	Standard Test Method for Sodium in Water by Atomic Absorption Spectrophotometry
ASTM D 4192	Standard Test Method for Potassium in Water by Atomic Absorption Spectrophotometry
ASTM D 4193	Standard Test Method for Thiocyanate in Water
ASTM D 5174	Standard Test Method for Trace Uranium in Water by Pulsed-Laser Phosphorimetry
ASTM D 5175	Standard Test Method for Organohalide Pesticides and Polychlorinated Biphenyls in Water by Microextraction and Gas Chromatography
ASTM D 5673	Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry
ASTM D 5904	Standard Test Method for Total Carbon, Inorganic Carbon, and Organic Carbon

	in Water by Ultraviolet, Persulfate Oxidation, and Membrane Conductivity Detection
ASTM D 6317	Standard Test Method for Low Level Determination of Total Carbon, Inorganic Carbon and Organic Carbon in Water by Ultraviolet, Persulfate Oxidation, and Membrane Conductivity Detection
DIN EN ISO 6468	Water quality - Determination of certain organochlorine insecticides, polychlorinated biphenyls and chlorobenzenes - Gas-chromatographic method after liquid-liquid extraction (ISO 6468:1996)
ASTM D 6508	Standard Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte
ASTM D 6581	Standard Test Methods for Bromate, Bromide, Chlorate, and Chlorite in Drinking Water by Suppressed Ion Chromatography
ASTM D 6919	Standard Test Method for Determination of Dissolved Alkali and Alkaline Earth Cations and Ammonium in Water and Wastewater by Ion Chromatography
ASTM D 6994	Standard Test Method for Determination of Metal Cyanide Complexes in Wastewater, Surface Water, Groundwater and Drinking Water Using Anion Exchange Chromatography with UV Detection
ASTM D 7237	Standard Test Method for Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection
DIN EN ISO 7393-3	Water quality - Determination of free chlorine and total chlorine - Part 3: Iodometric titration method for the determination of total chlorine (ISO 7393-3:1990)
ASTM D 7485	Standard Test Method for Determination of Nonylphenol, p-tert-Octylphenol, Nonylphenol Monoethoxylate and Nonylphenol Diethoxylate in Environmental Waters by Liquid Chromatography/Tandem Mass Spectrometry
ASTM D 7511	Standard Test Method for Total Cyanide by Segmented Flow Injection Analysis, In-Line Ultraviolet Digestion and Amperometric Detection
ASTM D 7574	Standard Test Method for Determination of Bisphenol A in Environmental Waters by Liquid Chromatography/Tandem Mass Spectrometry
ASTM D 7644	Standard Test Method for Determination of Bromadiolone, Brodifacoum, Diphacinone and Warfarin in Water by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)
ASTM D 7645	Standard Test Method for Determination of Aldicarb, Aldicarb Sulfone, Aldicarb Sulfoxide, Carbofuran, Methomyl, Oxamyl, and Thiofanox in Water by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)
ASTM D 7731	Standard Test Method for Determination of Dipropylene Glycol Monobutyl Ether and Ethylene Glycol Monobutyl Ether in Sea Water by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)
ISO 7875-1 Technical Corrigendum 1	Water quality - Determination of surfactants - Part 1: Determination of anionic surfactants by measurement of the methylene blue index (MBAS); Technical Corrigendum 1
DIN EN ISO 7980	Water quality - Determination of calcium and magnesium - Atomic absorption spectrometric method (ISO 7980:1986)
ISO 8165-2	Water quality - Determination of selected monovalent phenols - Part 2: Method by derivatization and gas chromatography
DIN EN ISO 8467	Water quality - Determination of permanganate index (ISO 8467:1993);
DIN EN ISO 9377-2	Water quality - Determination of hydrocarbon oil index - Part 2: Method using solvent extraction and gas chromatography (ISO 9377-2:2000)
DIN EN ISO 10301	Water quality - Determination of highly volatile halogenated hydrocarbons - Gas-chromatographic methods (ISO 10301:1997)
DIN EN ISO 10304-1	Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate (ISO 10304-1:2007)
DIN EN ISO 10304-4	Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 4: Determination of chlorate, chloride and chlorite in water with low contamination (ISO 10304-4:1997)
DIN EN ISO 11206	Water quality - Determination of dissolved bromate - Method using ion chromatography (IC) and post column reaction (PCR) (ISO 11206:2011)

DIN EN ISO 11369	Water quality - Determination of selected plant treatment agents - Method using high performance liquid chromatography with UV detection after solid-liquid extraction (ISO 11369:1997)
DIN EN ISO 11732	Water quality - Determination of ammonium nitrogen - Method by flow analysis (CFA and FIA) and spectrometric detection (ISO 11732:2005)
DIN EN ISO 11885	Water quality - Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (ISO 11885:2007)
DIN EN ISO 12010	Water quality - Determination of short-chain polychlorinated alkanes (SCCPs) in water - Method using gas chromatography-mass spectrometry (GC-MS) and negative-ion chemical ionization (NCI) (ISO 12010:2012)
DIN EN ISO 12846	Water quality - Determination of mercury - Method using atomic absorption spectrometry (AAS) with and without enrichment (ISO 12846:2012)
DIN ISO 15089	Water quality - Guidelines for selective immunoassays for the determination of plant treatment and pesticide agents (ISO 15089:2000)
DIN EN ISO 15680	Water quality - Gas-chromatographic determination of a number of monocyclic aromatic hydrocarbons, naphthalene and several chlorinated compounds using purge-and-trap and thermal desorption (ISO 15680:2003)
DIN EN ISO 15681-1	Water quality - Determination of orthophosphate and total phosphorus contents by flow analysis (FIA and CFA) - Part 1: Method by flow injection analysis (FIA) (ISO 15681-1:2003)
DIN EN ISO 15681-2	Water quality - Determination of orthophosphate and total phosphorus contents by flow analysis (FIA and CFA) - Part 2: Method by continuous flow analysis (CFA) (ISO 15681-2:2003)
DIN EN ISO 15913	Water quality - Determination of selected phenoxyalkanoic herbicides, including bentazones and hydroxybenzonitriles by gas chromatography and mass spectrometry after solid phase extraction and derivatization (ISO 15913:2000)
DIN EN ISO 16264	Water quality - Determination of soluble silicates by flow analysis (FIA and CFA) and photometric detection (ISO 16264:2002)
DIN EN ISO 16265	Water quality - Determination of the methylene blue active substances (MBAS) index - Method using continuous flow analysis (CFA) (ISO 16265:2009)
DIN EN ISO 16588	Water quality - Determination of six complexing agents - Gas-chromatographic method (ISO 16588:2002)
prEN 16691	Water quality - Determination of polycyclic aromatic hydrocarbons (PAH) in whole water samples using liquid solid extraction combined with gas chromatography mass spectrometry (GC-MS)
prEN 16693	Water quality - Determination of organochlorine pesticides (OCP) in whole water samples using solid phase extraction (SPE) with SPE-disks combined with gas chromatography mass spectrometry (GC-MS)
DIN EN 16694	Water quality - Determination of pentabromodiphenyl ether (PBDE) in whole water samples using solid phase extraction (SPE) with SPE-disks combined with gas chromatography - mass spectrometry (GC-MS)
DIN EN ISO 17294-1	Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 1: General guidelines (ISO 17294-1:2004)
DIN EN ISO 17294-2	Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 2: Determination of 62 elements (ISO 17294-2:2003)
DIN EN ISO 17353	Water quality - Determination of selected organotin compounds - Gas chromatographic method (ISO 17353:2004)
DIN EN ISO 17495	Water quality - Determination of selected nitrophenols - Method by solid-phase extraction and gas chromatography with mass spectrometric detection (ISO 17495:2001)
DIN EN ISO 17852	Water quality - Determination of mercury - Method using atomic fluorescence spectrometry (ISO 17852:2006)
DIN EN ISO 17943	Water quality - Determination of volatile organic compounds in water - Method using headspace solid-phase micro-extraction (HS-SPME) followed by gas chromatography-mass spectrometry (GC-MS) (ISO/DIS 17943:2014)
DIN EN ISO 18412	Water quality - Determination of chromium(VI) - Photometric method for weakly contaminated water (ISO 18412:2005)
DIN EN ISO 18856	Water quality - Determination of selected phthalates using gas

	chromatography/mass spectrometry (ISO 18856:2004)
DIN EN ISO 18857-1	Water quality - Determination of selected alkylphenols - Part 1: Method for non-filtered samples using liquid-liquid extraction and gas chromatography with mass selective detection (ISO 18857-1:2005)
DIN EN ISO 18857-2	Water quality - Determination of selected alkylphenols - Part 2: Gas chromatographic-mass spectrometric determination of alkylphenols, their ethoxylates and bisphenol A in non-filtered samples following solid-phase extraction and derivatisation (ISO 18857-2:2009)
DIN ISO 20179	Water quality - Determination of microcystins - Method using solid phase extraction (SPE) and high performance liquid chromatography (HPLC) with ultraviolet (UV) detection
DIN EN ISO 22478	Water quality - Determination of certain explosives and related compounds - Method using high-performance liquid chromatography (HPLC) with UV detection (ISO 22478:2006)
DIN EN ISO 23631	Water quality - Determination of dalapon, trichloroacetic acid and selected haloacetic acids - Method using gas chromatography (GC-ECD and/or GC-MS detection) after liquid-liquid extraction and derivatization (ISO 23631:2006)
DIN EN ISO 23631/AC	Water quality - Determination of dalapon, trichloroacetic acid and selected haloacetic acids - Method using gas chromatography (GC-ECD and/or GC-MS detection) after liquid-liquid extraction and derivatization (ISO 23631:2006)
DS/ISO 24293	Water quality - Determination of individual isomers of nonylphenol - Method using solid phase extraction (SPE) and gas chromatography/mass spectrometry (GC/MS)
DIN EN ISO 27108	Water quality - Determination of selected plant treatment agents and biocide products - Method using solid-phase microextraction (SPME) followed by gas chromatography-mass spectrometry (GC-MS) (ISO 27108:2010)
DIN ISO 28540	Water quality - Determination of 16 polycyclic aromatic hydrocarbons (PAH) in water - Method using gas chromatography with mass spectrometric detection (GC-MS)
DS/ISO/TS 28581	Water quality - Determination of selected non-polar substances - Method using gas chromatography with mass spectrometric detection (GC-MS)
DS/ISO 29441	Water quality - Determination of total nitrogen after UV digestion - Method using flow analysis (CFA and FIA) and spectrometric detection
ASTM D 4922	Standard Test Method for Determination of Radioactive Iron in Water
ASTM D 5811	Standard Test Method for Strontium-90 in Water
ASTM D 5072	Standard Test Method for Radon in Drinking Water
ASTM D 6239	Standard Test Method for Uranium in Drinking Water by High-Resolution Alpha-Liquid-Scintillation Spectrometry
DS/ISO 10704	Water quality - Measurement of gross alpha and gross beta activity in non-saline water - Thin source deposit method
ASTM D 5542	Standard Test Methods for Trace Anions in High Purity Water by Ion Chromatography
ASTM D 1976	Standard Test Method for Elements in Water by Inductively-Coupled Argon Plasma Atomic Emission Spectroscopy
ASTM E 2111	Standard Quantitative Carrier Test Method to Evaluate the Bactericidal, Fungicidal, Mycobactericidal, and Sporicidal Potencies of Liquid Chemicals
ASTM D 4839	Standard Test Method for Total Carbon and Organic Carbon in Water by Ultraviolet, or Persulfate Oxidation, or Both, and Infrared Detection
ASTM D 7730	Standard Test Method for Determination of Dioctyl Sulfosuccinate in Sea Water by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)
ASTM D 5790	Standard Test Method for Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry
ASTM D 5316	Standard Test Method for 1,2-Dibromoethane and 1,2-Dibromo-3-Chloropropane in Water by Microextraction and Gas Chromatography
ASTM D 5315	Standard Test Method for Determination of N-Methyl-Carbamoyloximes and N-Methylcarbamates in Water by Direct Aqueous Injection HPLC with Post-Column Derivatization
ASTM D 5317	Standard Test Method for Determination of Chlorinated Organic Acid

	Compounds in Water by Gas Chromatography with an Electron Capture Detector
DIN EN 25663	Water quality; determination of Kjeldahl nitrogen; method after mineralization with selenium (ISO 5663:1984)
DIN EN 26777	Water quality; determination of nitrite; molecular absorption spectrometric method (ISO 6777:1984)